



Nevada Site Specific Advisory Board (NSSAB) Table of Contents

Full Board Meeting Handouts for Wednesday, May 19, 2021

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NSSAB FULL BOARD MEETING ATTENDANCE

October 2020 through September 2021 (FY 2021)

Name		*11/18/20	*1/20/2021	*3/17/2021	*5/19/2021	7/21/21	9/22/21	Max Terms
MEMBERS								
Gail Alexander		√	√	√				2026
Francis Bonesteel		√	√	√				2022
William DeWitt		√	√	√				2024
Bill Dolan		√	√	E				2026
Karen Eastman		√	√	√				2020
Gary Elgort		√	√	√				2026
Charles Fullen		√	E	√				2022
Anthony Graham		√	√	√				2024
Mark Hilton		√	√	√				2026
Bruce Jabbour		√	E	√				2026
Ron Korner		√	√	√				2026
James Moldenhauer		√	√	E				2026
Dan Peterson		√	√	√				2026
Janice Six		√	√	√				2024
Richard Stephans		√	√	E				2022
Favil West		√	√	√				2026
Dina Williamson-Erdag		√	√	√				2022
LIAISONS								
Clark County		√	√	√				
Consolidated Group of Tribes & Organizations		E	√	√				
Elko County Commission (limited)								
Esmeralda County Commission		U	E	U				
Lincoln County Commission		U	U	U				
Nye County Commission		U	E	U				
Nye County Emergency Management		√	√	√				
Nye Co. Natural Resources and Federal Facility		√	E	√				
State of NV Division of Env Protection		√	√	√				
U.S. Natl Park Service (limited)		√	√					
White Pine County Commission (limited)								
KEY: √ - Present E - Excused V - Vacant U - Unexcused								
*Virtual Full Board Meeting								

External Peer Review Team Composition for Central and Western Pahute Mesa – Work Plan Item #2



John Myers, Underground Test Area (UGTA) Activity Lead
Environmental Management (EM) Nevada Program
U.S. Department of Energy (DOE)
May 19, 2021



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safety – performance – cleanup – closure

ID 2558 – 5/19/2021
Log No: EMRP-2021-037

NSSAB – Work Plan Item #2

- From a community perspective, the Nevada Site Specific Advisory Board (NSSAB) will provide a recommendation on what types of representation should be on the external peer review (EPR) team for Pahute Mesa
- NSSAB recommendation is due tonight



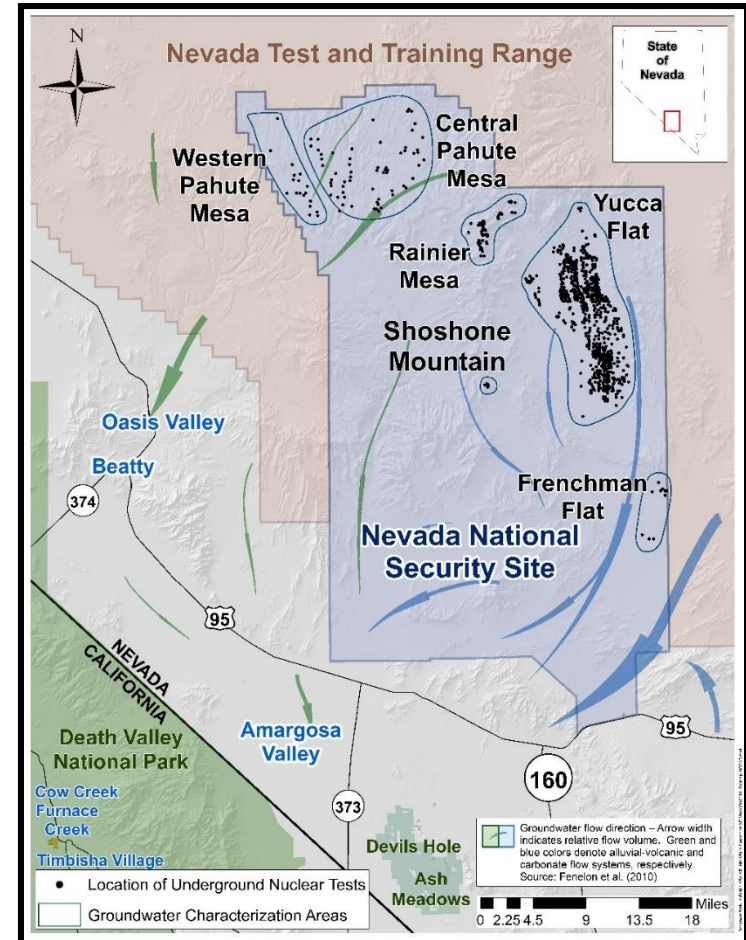


Outline

- Background
- EPR Process
- EPR Lessons Learned
- EPR Team Composition
- Questions
- NSSAB Input

Background – Pahute Mesa

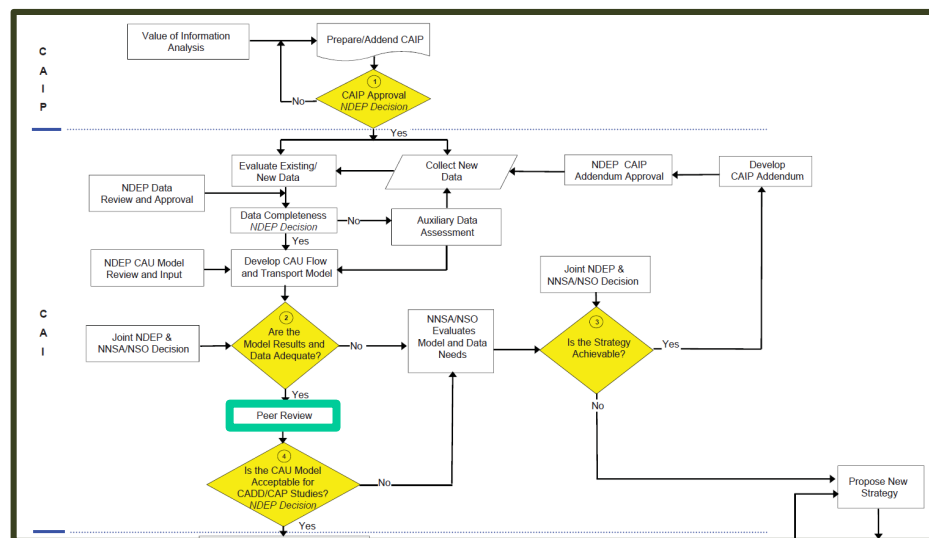
- 82 Corrective Action Sites
- 60% of the Nevada National Security Site (NNSS) inventory (~ 27 million curies in 2012)
- Pahute Mesa will be the fourth to undergo peer review
 - Frenchman Flat in 2010
 - Yucca Flat/Climax Mine in 2014
 - Rainier Mesa/Shoshone Mountain in 2017/2018
- Pahute Mesa EPR planned for 2022



**Western and Central Pahute Mesa are managed as one entity*

EPR Background

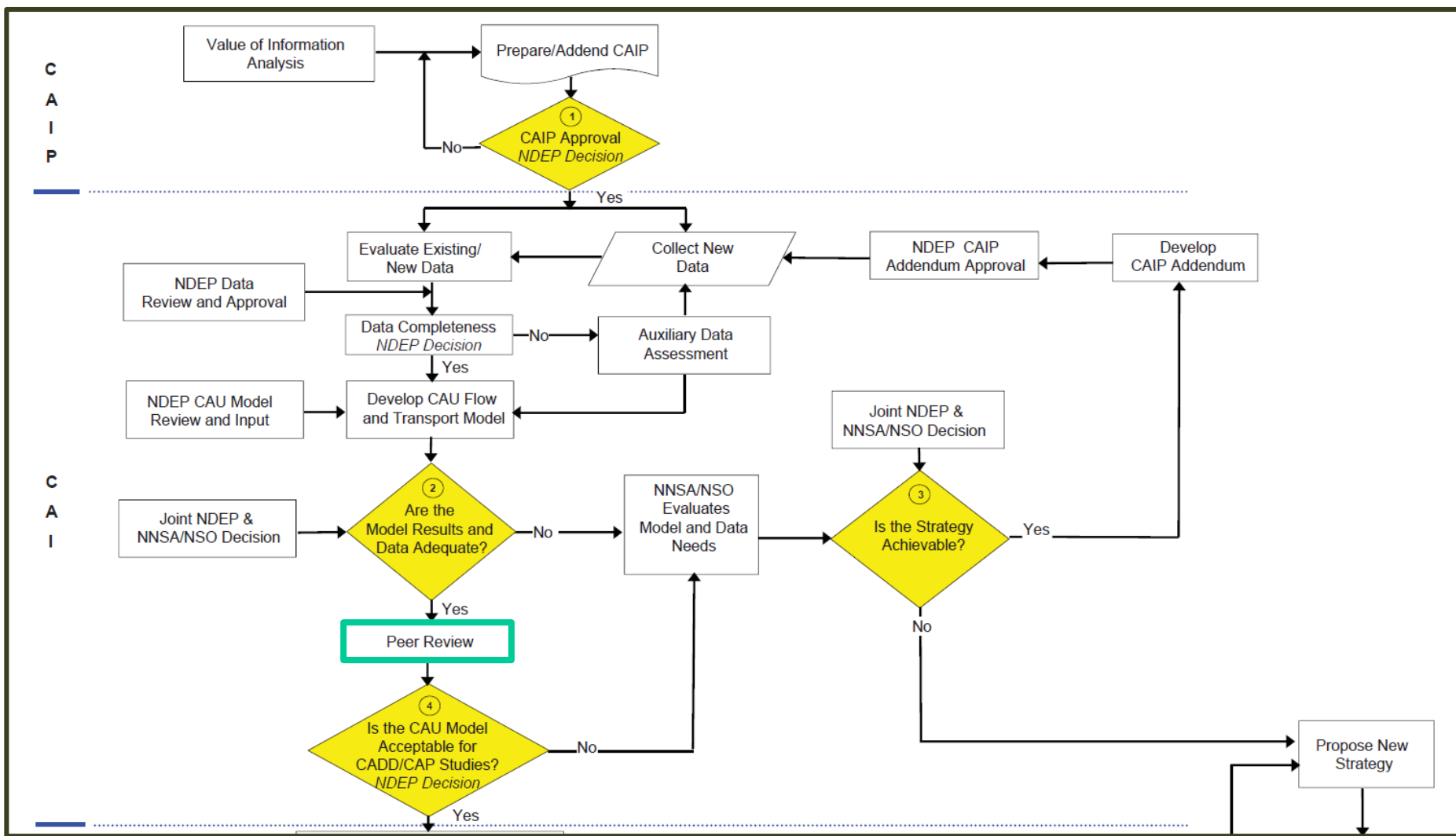
- Required by the Federal Facility Agreement and Consent Order (FFACO) during the Corrective Action Investigation (CAI) stage
- Held after internal review and State of Nevada Division of Environmental Protection (NDEP) acceptance of the Corrective Action Unit (CAU) flow and transport modeling work is completed and documented
- Specific questions are developed for the EPR team to answer while completing their evaluation



**Portion of the UGTA FFACO Strategy
(larger depiction on next page)**



Portion of the UGTA FFACO Strategy



EPR Process

- EPR team consists of scientific experts in multiple disciplines (e.g., regulatory, geology, hydrology, physics, modeling, radiochemistry, etc.)
- Planning to completion typically takes a full year
- Conduct a mock-up peer review internally to prepare
- Provide tour, presentations, and discussions for EPR members to become familiar with activity



EPR Process

(continued)

- EPR anticipated to involve many hours of work per reviewer over a six month period
 - EPR team members expected to review over 2,000 pages of technical information, view the modeling outcomes, etc.
- DOE and EPR team participate in additional discussions after review is completed, if necessary
- DOE receives report and close-out from the EPR team
- DOE will complete additional work, if necessary; prepare a response to the EPR team report; and request approval from NDEP for the Pahute Mesa model to proceed to the Corrective Action Decision Document/Corrective Action Plan (CADD/CAP) stage of the FFACO



EPR Lessons Learned

- Consider regulatory perspectives of scientific questions when developing paths forward
 - Include regulator on EPR team
- Allow model uncertainties identified by EPR team to be addressed during the CADD/CAP stage rather than requiring a second phase CAI stage



Rainier Mesa External Peer Review



NSSAB – Work Plan Item #2

- From a community perspective, the NSSAB will provide a recommendation on what types of representation should be on the EPR team for Pahute Mesa

Recommendation



Criteria for Pahute Mesa EPR Members

- DOE will concentrate on the following technical fields:
 - Geology
 - Hydrogeology
 - Groundwater flow and transport modeling
 - Uncertainty analysis
 - Geochemistry/radiochemistry
 - Regulatory risk analysis
- Ideally, candidates will have practical, real-world experience conducting or reviewing hydrologic or contaminant transport studies within a regulatory environment



Criteria for Pahute Mesa EPR Members

(continued)

- Geologist
 - Expert to evaluate the geologic conceptual and framework models and its relationship to hydrogeologic setting
 - Experience in rock deformation effects (e.g. faulting) on hydrogeologic processes and parameters around nuclear detonations
- Hydrogeologist
 - Expert to review interpretations of geologic, hydrologic and geochemical/radiochemical data to form an internally consistent interpretation of the flow and transport system
 - Experience in hydrology of arid environment with deep groundwater tables



Criteria for Pahute Mesa EPR Members (continued)

- Groundwater Flow and Transport Modeler
 - Expert with broad experience modeling groundwater flow and transport
 - Experience in fractured/faulted groundwater systems



External Peer Review Tour of Frenchman Flat



Criteria for Pahute Mesa EPR Members

(continued)

- Geochemist/Radiochemist
 - Expert with understanding of processes and geochemical factors affecting transport of radionuclides in groundwater
 - Experience in applying naturally occurring isotopic and chemical variations to the interpretation of groundwater systems
 - Experience with radionuclides unique to nuclear testing
- Regulator
 - Expert with earth science/nuclear waste background
 - Experience in evaluating compliance with regulatory standards and/or use of models to inform decision-making



Pahute Mesa EPR Observers

- NDEP staff
- Nye County representative - NSSAB recommendation from November 2013
- NSSAB members – two (2) volunteers



NSSAB Observed Rainier Mesa
External Peer Review



Review

- The EPR is an important part of the FFACO process to help gain confidence in the models
- Pahute Mesa is the fourth CAU to undergo the EPR
- Implementing lessons learned from previous EPRs



QUESTIONS



NSSAB Path Forward – Work Plan Item #2



- From a community perspective, the NSSAB will provide a recommendation on what types of representation should be on the EPR team for Pahute Mesa
- NSSAB recommendation is due tonight

Corrective Action Unit (CAU) 111, Area 5 Closed Mixed Waste Cells, Revegetation Path Forward – Work Plan Item #1



Tiffany Gamero, Long-Term Monitoring Lead
Environmental Management (EM) Nevada Program
U.S. Department of Energy (DOE)
May 19, 2021



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ID 2557 – 5/19/2021
Log No: EMRP-2021-038

NSSAB – Work Plan Item #1

- From a community perspective, the Nevada Site Specific Advisory Board (NSSAB) will provide a recommendation suggesting a path forward regarding the vegetative cover at CAU 111
- NSSAB recommendation is due tonight

Recommendations



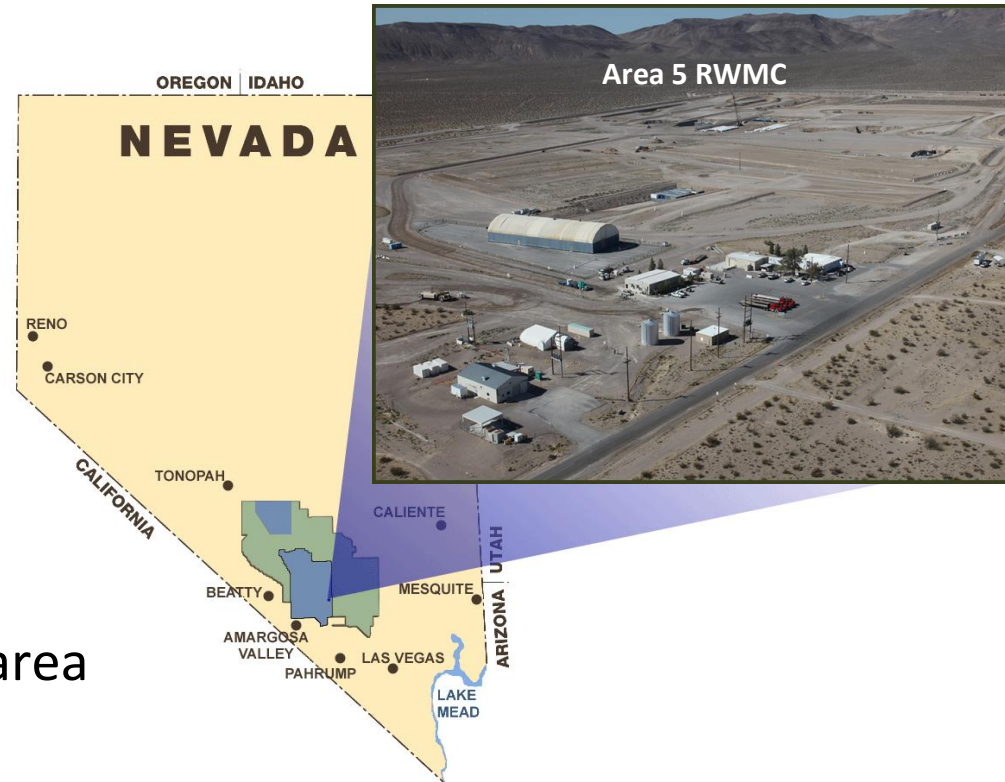


Outline

- CAU 111 and the 92-Acre Area
- Revegetation History
- Tribal Revegetation Project
- Recommendations and Lessons Learned
- Proposed Work Strategy and Timeline
- Questions
- NSSAB Input

CAU 111 and the 92-Acre Area

- Located in Area 5 of the Nevada National Security Site (NNSS) at the Radioactive Waste Management Complex (RWMC)
- CAU 111 was addressed for closure under the Federal Facility Agreement and Consent Order (FFACO)
 - Part of a larger waste disposal area that comprises 92 acres
- The entire 92-Acre Area was addressed for FFACO closure in conjunction with CAU 111 and is subject to the closure requirements
- * For consistency, the term 92-Acre Area will be used in this presentation



History of Revegetation at the 92-Acre Area

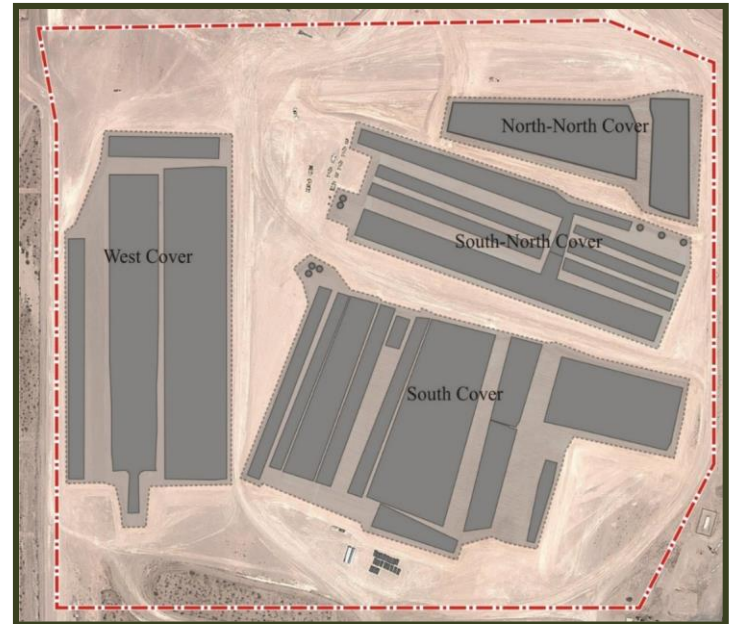
- Area includes boreholes, trenches, and pits where waste was buried between 1961 and 2010
 - Four 8-foot-thick engineered covers were installed in 2011
- In 2009, the State of Nevada Division of Environmental Protection (NDEP) and DOE agreed on a closure path consisting of a vegetative cover



- Vegetation:
 - Inhibits precipitation from percolating deep into the soil by returning moisture to the atmosphere by evapotranspiration
 - Minimizes wind and water erosion on the covers and stabilizes soils

History of Revegetation at the 92-Acre Area (continued)

- In October 2011, all covers were broadcast seeded and irrigated
 - Plants initially sprouted, but most were dead by May 2013
- In October 2013, test plots were established on North-North cover
 - Broadcast seeded, hydroseeded, and irrigated
 - Some plants sprouted, but a viable community was not established
- In October 2014, test plots were established on South-North cover
 - Seeded, mulched, and irrigated
 - Some plants sprouted, but a viable community was not established



Prior NSSAB Recommendations

- In May 2016, the NSSAB was consulted about a possible path forward to successfully revegetate the 92-Acre Area
 - The NSSAB provided a number of recommendations, including:
 - Saving the topsoil when constructing waste cells and stockpiling for future use
 - Collect seeds from the local vicinity for use
 - Consider transplants
 - Experiment with smaller test plots, using varying parameters
 - Prepare the soil in advance
 - Recognize that each site is unique and should be considered separately
- U.S. Department of Energy

NSSAB

Nevada Site Specific Advisory Board

May 18, 2016

Members
Michael Anderson
Anna Anderson
Michael D'Amico
Dennis Hines, Chair
Jettie Kellerman, Vice Chair
Michael Moore
Donald Nell
Edward Rosenblatt
David Rosenblatt
William Sears
Thomas Tully
Cecilia Flores Snyder
Jack Tipton
Francisca Vega

Local Stakeholders
Clark County
Consolidated Group of Tribes and Organizations
Nevada County Commission
Nye County Commission
Nye County Emergency Management
Nye County Nuclear Waste Repository Project Office
State of Nevada Division of Environmental Protection
U.S. National Park Service

Administration
Barbara Limer, Administrator
Kathy Snyder, COFO
U.S. Department of Energy, Nevada Field Office

Mr. Robert F. Boehlecke
Environmental Management Operations Manager
U.S. Department of Energy, Nevada Field Office
P. O. Box 95518
Las Vegas, NV 89193-5518

SUBJECT: Recommendation for Revegetation at Corrective Action Unit (CAU) 111 (Work Plan #3)

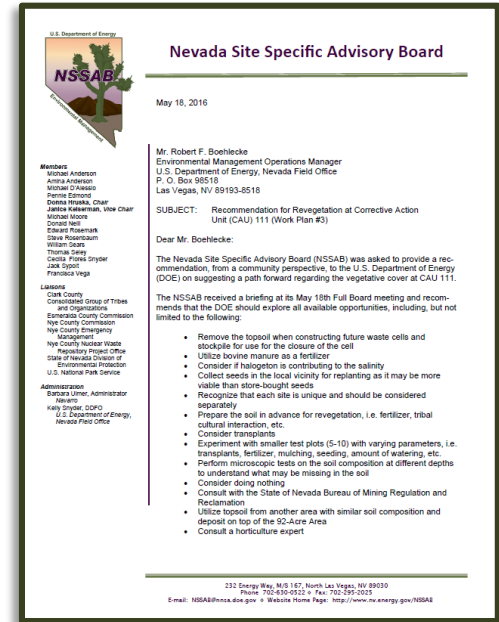
Dear Mr. Boehlecke:

The Nevada Site Specific Advisory Board (NSSAB) was asked to provide a recommendation, from a community perspective, to the U.S. Department of Energy (DOE) on suggesting a path forward regarding the vegetative cover at CAU 111.

The NSSAB received a briefing at its May 18th Full Board meeting and recommends that the DOE should explore all available opportunities, including, but not limited to the following:

 - Remove the topsoil when constructing future waste cells and stockpile for use for the closure of the cell
 - Utilize bovine manure as a fertilizer
 - Consider if haloseton is contributing to the salinity
 - Collect seeds in the local vicinity for replanting as it may be more viable than store-bought seeds
 - Recognize that each site is unique and should be considered separately
 - Prepare the soil in advance for revegetation, i.e. fertilizer, tribal cultural interaction, etc.
 - Consider transplants
 - Experiment with smaller test plots (5-10) with varying parameters, i.e. transplants, fertilizer, mulching, seeding, amount of watering, etc.
 - Perform microscopic tests on the soil composition at different depths to understand what may be missing in the soil
 - Consider doing nothing
 - Consult with the State of Nevada Bureau of Mining Regulation and Reclamation
 - Utilize topsoil from another area with similar soil composition and deposit on top of the 92-Acre Area
 - Consult a horticulture expert

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E-mail: NSSAB@hnsa.doe.gov • Website Home Page: <http://www.ne.energy.gov/NSSAB>



Tribal Revegetation Project

- One of the NSSAB's recommendations was that the EM Nevada Program consider any recommendations offered by the Tribes
- The Tribal Revegetation Project formed the same year
 - Includes representatives from the 16 American Indian Tribal Nations and Affiliated Groups with cultural and historical ties to the NNSS, with a goal to determine the best path forward for the 92-Acre Area covers



Tribal Revegetation Project (continued)

- New test plots were established on the 92-Acre Area using various combinations of revegetation and outplant* treatments during two planting seasons (Fall 2017 and Spring 2018)



*Definition of an outplant: a plant transplanted from a nursery bed, greenhouse, or other location to an outside area

- Monitoring of the test plots was conducted from 2018-2020 by Tribal members and the Desert Research Institute (DRI)
- Test plots were routinely irrigated through Fall 2020
- A final project report, detailing the observations and recommendations, was delivered to the EM Nevada Program in March 2021



Recommendations and Lessons Learned

- Over the past several years, many recommendations and lessons learned regarding revegetation at the NNSS have been gleaned by multiple sources, including but not limited to:
 - Tribal Revegetation Project
 - DRI
 - Mission Support and Test Services, LLC [MSTS]
(NNSS Management and Operating Contractor)
 - Navarro
 - NSSAB
 - Other organizations performing work on the NNSS



Recommendations and Lessons Learned (continued)

- The following are some of the recommendations and lessons learned to be considered for use at the 92-Acre Area:
 - Include Tribal interaction
 - Use of mulch and stockpiled topsoil
 - Use of a planting subcontractor
 - Including outplants
 - Timely installation of a rabbit fence; caging outplants
 - Planting in the spring
 - Use of locally gathered seeds, if possible
 - Supplement precipitation with irrigation
 - Use of wheel irrigation



Proposed Work Strategy

- **Seeding**

- Mixture of native plant species suited to the Mojave Desert ecology of Area 5 RWMC
- The top 12 to 18 inches of soil will be ripped to alleviate compaction
- Seeds will be broadcast using a drill seeder with drag chains to cover the seeds
- Mulch will be applied using a hydromulcher
- Irrigation will be used to supplement precipitation

- **Outplants**

- The Nevada Division of Forestry or similar supplier will be subcontracted to grow plants from seeds provided by MSTs
- Irrigation will be used to supplement precipitation



Proposed Timeline

- The revegetation of the 92-Acre Area is proposed to be segmented into stages due to size of the area and limited resources, such as water
 - Even though the actual area to be planted is approximately 54 acres, not 92, it is still a significant undertaking
 - Other recently revegetated covers at the Area 5 RWMC will still require irrigation and maintenance, adding to the resource limitations
- Seeding/planting to occur in 2023-2027
- All seeding/planting to occur in the spring



Next Steps



- EM Nevada Program:
 - Review and receive concurrence on a path forward with NDEP
 - Draft a written plan for NDEP's review and approval

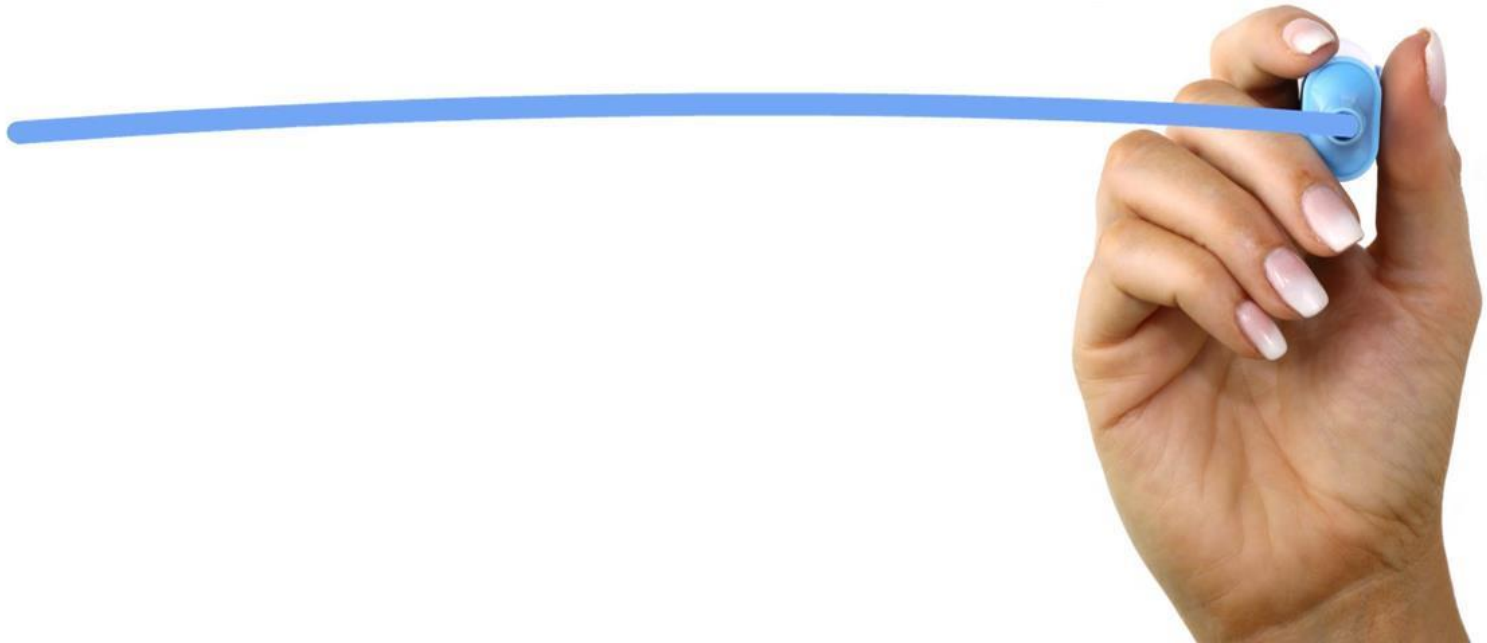
Review



- The 92-Acre Area needs a successful vegetative cover
- Many of the Tribal Revegetation Project test plots resulted in successful vegetative growth and produced multiple recommendations for a path forward
- The proposed plan uses many recommendations and lessons learned from the Tribal Revegetation Project, DRI, NSSAB, and other organizations performing work on the NNSS
- The proposed plan includes seeding and installing outplants on the vegetative cover in stages from 2023-2027



QUESTIONS



NSSAB Path Forward – Work Plan Item 1



- From a community perspective, the NSSAB will provide a recommendation suggesting a path forward regarding the vegetative cover at CAU 111
- NSSAB recommendation is due tonight

